GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

Contents for Week of February 2, 1942. Vol. XX. No. 28.

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NOW IS THE TIME . . . TO TEACH GEOGRAPHY.

—U. S. Commissioner of Education

"Now is the time to teach the American people geography. I think, apart from some backward nations, we are more illiterate in geography than any other civilized nation.

"The reason is that we have never taught geography. Young people have stopped studying geography beyond the 7th and 8th grades of the schools, and they have been taught by people who stopped studying geography at about the same time.

"I recommend that in some way throughout the secondary schools and colleges and universities a real effort be made to acquaint American citizens with the realities of the world situation."

(Quotation from a speech by Dr. John W. Studebaker, U. S. Commissioner of Education, delivered January 3, 1942, at the National Conference of College and University Presidents on Higher Education and the War, Baltimore, Maryland)

WAR SPURS STUDY OF GEOGRAPHY

In Egypt (above) and elsewhere, war has popularized geography. Victory may be decided by the terrain of a battlefield, weather conditions, material resources from which war supplies can be manufactured, transportation routes, and other information which the study of geography provides.

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922. Copyright, 1942, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

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General Headquarters, Washington, D. C.

Darwin Leads Australia's Defense Parade

WHILE Australia is ringed around with a steel stockade of mined waters and fortified harbors, one port has suddenly gained great importance as a base because it is nearest to the embattled islands of the Malay Archipelago. It is Darwin, a small and isolated town in the northern region known as "outback," where the unpopulated tropical coastline is now a front line of the war.

It was in Darwin that the U. S. Army hospital ship *Mactan* landed the wounded soldiers and sailors evacuated from the Philippines.

Oriental in many aspects, because of its proximity to Japan, China, and the Netherlands Indies, the port is entirely English in title. It was named for Charles Darwin, the famous naturalist.

"A Continent Away" from Southern Cities

Set about halfway along the deeply indented northern coast of Australia as it thrusts a broad peninsula toward the heart of the rich Netherlands Indies, the port of Darwin is a continent away from the leading Australian distribution and population centers. Only recently it has received its first telephone trunk line to the better known southern cities.

Although it is the only town of consequence in a thousand-mile stretch of north central Australia, it normally has a population of little more than 2,000 people. Lately this figure has been multiplied by three, as military forces and civilians have been rushed there for war activities.

In 1939, Darwin celebrated its one-hundredth birthday, a century of existence that was nearly over before the port began to grow. Settlers shunned this hot, steaming site, only 12 degrees south of the Equator, as they did its vast tropical hinterland, the Northern Territory, of which Darwin is the capital. Although the government spent an estimated hundred million dollars to colonize the Northern Territory, fewer than 7,000 permanent inhabitants were counted there in a recent census. With an area of 523,620 square miles, this means that the Northern Territory has more than 70 square miles of space for each person.

Air Service Came Before Highways

While regular air service has been in effect by way of Darwin for some years, cross-country rail communications to it have never been completed. In the late 1880's, a railway was started with federal funds designed to aid in opening up settlement. Gradually it was extended from Darwin to Birdum, something over 300 miles to the southeast. In the meantime, another line pushed northward, until steel joined Adelaide, on the southern coast, with Alice Springs, in the geographic center of the island continent. The transportation break between Birdum and Alice Springs now has been closed by a new military road, rushed to completion near the end of 1940.

Darwin (illustration, next page) has an excellent harbor (one of the best in the Pacific), which makes it extremely useful as a naval base for operations in the southwestern Pacific. Because of its location and its increasing facilities for repair and operation, it is especially convenient for Australian patrol ships. A larger airport and improved flying facilities, too, for both Army and Navy planes, have brought predictions that Darwin is on the way to becoming one of the British Empire's most important air bases in the East.

Civilian Darwin—where white men, Australians, British, and an occasional

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Publishers Photo Service

A SITE FIRST FORTIFIED BY SARACENS A THOUSAND YEARS AGO HAS BEEN STRENGTHENED BY THE BRITISH

Following the example of the Saracens in the 9th century, and of the Knights of Malta who fortified the island against the Turks more than 300 years ago, the British have reinforced and modernized the defenses of Malta. In Axis hands this Mediterranean isle would be a stepping stone from Sicily and the toe of Italy to the Axis forces in Libia. German and Italian planes have swung down from Italian bases less than sixty miles to the north, bombing the fortress with grim persistence. In one of the ancient forts a bell, rung when the Turks besieged the town centuries ago, still hangs, and old guns pointing out over Grand Harbour (above) have served as a saluting battery for the up-to-date British Mediterranean fleet (Bulletin No. 3).

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Pacific Theater of War Mapped by National Geographic Society

THE Pacific Ocean, its myriad islands, and the shores of adjoining continents are pictured as the largest theater of war in world history in a new ten-color map being distributed by the National Geographic Society to its 1,165,000 members.

The map spans more than half the earth's circumference. It shows not only the immediate major battlegrounds of the Philippines, the Malay Peninsula, the Netherlands Indies, and China, but sweeps eastward across the Pacific to include most of North America and the west coast of South America. Australia, eastern Asia, and the long chains of Japanese islands also are shown. Ownership of each group of islands is indicated in red letters.

Relative Position of Japanese, British, American Bases

The map, whose preparation was begun months ago when tension in the Pacific was increasing, makes clear the relative position of the bases of the nations engaged in the war.

Near the center are the Hawaiian Islands, where Japan began the war with a surprise bombing attack on Pearl Harbor on December 7. Guam, Wake, and Midway Islands, where tiny U. S. forces made epic defenses, lie to the west and south.

Far to the north, but closer to Japan, are the American-owned Aleutian Islands, stretching westward from the southwest tip of Alaska. The powerful naval and air stations which have been developed there are indicated.

The map is unusual in that it shows numerous other bits of territory belonging to the U. S. in the Pacific, most of them so small that they appear only as dots. Among these are Johnston, Kingman Reef, Palmyra, Howland, Baker, Jarvis, Eastern Samoa, and Swains islands. Some of these suddenly became important with the development of air routes across the Pacific, to New Zealand and Australia as well as to China and Singapore.

Nukunono, Starbuck, and Manihiki Among U. S. Islands

In addition, the United States has laid claim to more than a score of small, less familiar islands. They are scattered through the South Pacific south and west of Hawaii. They are Christmas, Malden, Starbuck, Vostok, Caroline, Flint, and Danger Islands, Tongareva, Rakahanga, and Manihiki, in the Line Islands; Nukulaelae, Nukufetau, and Funafuti, in the Ellice Islands; Canton, Enderbury, McKean, Birnie, Hull, Gardner, Phoenix, and Sydney, in the Phoenix Islands; and the Tokelau or Union group composed of Atafu, Nukunono, and Fakaofo.

The National Geographic Map also shows how the Japanese-mandated islands —the Marianas, Caroline, and Marshall groups—provide enemy bases south of Japan and east of the Philippines. They are spread over an east-west distance of more than 3,000 miles just north of the Equator.

An interesting feature of the Pacific map is the International Date Line, which stretches from pole to pole west of Hawaii and east of New Zealand. When it is Sunday on the eastern side of the Date Line, it is Monday on the west. The map also carries a series of clocks showing the hour in each time zone when it is midnight at Greenwich, England. The time differences have become important with the increase of short wave broadcasts of war bulletins from Pacific spots.

The vastness of the Pacific is indicated by a table, given in a corner of the map, of 861 airline distances between important cities and islands. Manila, the bombed capital of the Philippines, for example, is 5,300 miles from Honolulu.

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Netherlander are in the minority—is a conglomerate town of mixed races and habits. Chinese, Japanese, Malays, Singhalese, and native bushmen contribute the non-white elements.

For the white man, especially just before the rains come, when the humidity runs between 80 and 90 per cent and the temperature hovers around 100 degrees Fahrenheit, the climate is all but unbearable. Then the first monsoon storm introduces a four or five months' period of downpour, thunder and lightning. Nature meanwhile offers compensation for the bad weather in the vivid colors and scents of flowering vines and trees—honeysuckle, poinciana, and the delightfully perfumed frangipani and milkwood-tree.

Darwin can present exotic scenes where painted dancers of the East sway to vibrant, one-stringed fiddles and music sticks. Chinese girls patter along in embroidered sandals, silk trousers, and wide-sleeved coats, against a background of carved joss houses, small shrines, and gold, black, and crimson signs hung from street balconies—while over it all lies a breath of incense, spiced cooking, and the incongruous sound of some radio blaring forth swing music and war bulletins from a distant city.

Note: For further information about Australia, see "Beyond Australia's Cities." *National Geographic Magazine*, December, 1936, and the following GEOGRAPHIC SCHOOL BULLETINS: "'Front Line' for Australia and New Zealand Is Southeast Asia," January 6, 1941, and "War over Wives Touches Darwin, Australia," March 14, 1938.

Darwin may be located on the National Geographic Society's Map of the Indian Ocean.

Bulletin No. 1, February 2, 1942.

Photograph by Captain Frank Hurley

A FINGER OF LAND PUSHES DARWIN OUT TO SEA

Taken before war dangers brought fortifications and naval works, the photograph shows how Darwin occupies a narrow peninsula between a sheltered bay (foreground) and the waters of Clarence Strait (background). The strait, with Melville Island to the north, empties into the tropical waters of Timor Sea, which stretches from Australia's northwest shore to the Netherlands island of Timor. Between Timor Sea and the sandy desert of the Northern Territory, Darwin has been effectively cut off from communication with the rest of Australia, and its growth was slow because of the isolation. The low white houses of the town have generous veranda and window space because of the tropical heat and humidity of the Northern Territory.

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Malta Is Hot Spot and Melting Pot of the Mediterranean

MALTA, Britain's powerful naval base which lies where Mediterranean sea lanes cross from Gibraltar to Suez, from Europe to Africa, has the honor of front rank among the world's most bombed spots. Being only 58 miles south of Sicily, it has need of its great defensive strength for, since the entrance of Italy into the war, it has been battered by more than 1,200 air raids.

The Grand Harbour of Valletta, on the title island of Malta, is itself large enough to shelter the entire British Mediterranean fleet. Yet Malta, largest island of the little group, is less than 100 square miles in extent; Gozo, next in size, less than half as large; while Comino, the only other inhabited island, is only a mile square. Cominotto is a tiny islet, and Filfla a rock which is used as a target for naval gun practice.

Maltese a Mixture of Many Peoples

This little archipelago has figured in history and legend since before the Apostle Paul was shipwrecked on its shores. The Maltese say that Ulysses came their way. Ancient seagoing Phoenicians founded on Malta's deeply indented coasts ports from which to base their trade and explorations in the western Mediterranean. Six centuries before Christ, the Carthaginians moved in, to be followed by the conquering Romans. Greeks, Saracens, Normans, and Spaniards, all had their share in the mixed heritage of blood and culture, but it was under the reign of the Knights of St. John of Jerusalem, more commonly known as the Knights of Malta, that the island saw its most colorful and romantic period. For nearly 300 years this Crusading Order upheld its rich and feudal aristocracy of castle, church, and fortress. Then Napoleon came along on his way to Egypt, in 1798, and effectively ended their picturesque regime.

In 1814 the Congress of Vienna awarded the islands to Great Britain, but the coinage of the Knights was legal tender until 1886, and the language of the courts was Italian until officially changed to Maltese. This latter language is basically Phoenician, with traces of Latin and Arabic—to all intents and purposes the language of Hannibal. However, most business is transacted in English, which is also the language of the street signs. English texts are used in the small university, with lectures in English and Maltese (Italian was formerly included).

During the first World War, Malta again became an important name in international annals, being a leading base for Allied military operations and a hospital and recuperation center. As a result of the current war, many women and children have been evacuated from the islands.

Defenses Make Malta an Island Gibraltar

As at Gibraltar, the rocky island of Malta is honeycombed with ancient underground passages and catacombs which have been put into service as part of the defense system. While the intricacies of the modern fortifications of the island are closely guarded secrets, its general strength has long been recognized. The massive castles and frowning 16th century fortresses, which the Knights of Malta built as protection against the Turks, have been strengthened, and secret harbors and submarine bases set up in the deep inlets which fringe the coast. From the old Valletta ramparts, called the Upper Baracca, great modern guns now point their muzzles toward the sea.

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Among the other figures given for distances between Pacific points prominent in the news are the following: Batavia, Java, to Singapore, 555 miles; to Darwin, Australia, 1,690 miles.

Note: A Map of the Theater of War in the Pacific Ocean, a supplement to the February, 1942, issue of the *National Geographic Magazine*, may be obtained from the National Geographic Society's headquarters in Washington, D. C.

Bulletin No. 2, February 2, 1942.

MERMAIDS AND MINDANAO, AMERICAE AND IAPAN WERE IN OCEANUS ORIENTALIS

The Pacific was called the "Western Ocean" in the famous pioneer atlas of Abraham Ortelius (published under the title of *Theatrum Orbis Terrarum*, Theater of Lands of the World, at Antwerp in 1570). The 53 maps were decorated with mermaids and spouting whales, sea monsters, and galleons with full sails. The *Occidentalis pars Americae* (western part of America) was portrayed as no farther from Japan than was China. Mindanao in the Philippines had then the name by which it is still known, as did Celebes and Borneo, although the relative positions and sizes of the islands were inaccurate.

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What Is the Best Defense Against Air Raids?

WITH blackout curtains and air raid refuges, fire precautions and first aid training, the United States in its first months of war has been preparing to protect civilians, especially in coastal cities, from possible enemy air raids. Throughout the preparations the inquiry has been repeated—what is the best way to save the country from extensive damage by enemy bombing?

A clue to the answer appeared in the 1942 program for building war equipment, announced to Congress by President Roosevelt at the beginning of the year: 60,000 planes, 20,000 anti-aircraft guns, to be increased in 1943 to 125,000 planes and 35,000 guns. The ratio indicates what Britain's experience already in this war has shown to be true, according to British officers who have been interviewed in this country. The most effective weapon against an attacking enemy airplane is—another airplane. Anti-aircraft guns have great nuisance value in spoiling the aim of an enemy bomber, but fighter planes are the best defense against air attack.

What Anti-Aircraft Guns Try To Do

How effective are anti-aircraft guns? How can they hit a target like a speedy, elusive plane? Isn't it difficult to fire heavy projectiles several miles up into the air against the strong pull of gravity?

These questions are arising in the minds of many Americans, now that coastal cities are setting up guns to guard against air raids.

Actually, experience elsewhere in this war demonstrates that the chief value of anti-aircraft guns is not in bringing down enemy bombers, but in making them fly high and spoiling their aim.

If a bombing plane is to score a hit on its target on the ground far below, it must fly in a straight line toward the target long enough to give the bombardier a chance to set his bomb sight accurately. It is during this period that a bombing plane is vulnerable to anti-aircraft fire, for then the pilot must not dodge or follow a zigzag course.

Timing Is Important for Anti-Aircraft Guns

The strength of the powder charge is sufficient to overcome the pull of gravity, therefore the principal concern of the anti-aircraft gunners is to try to get their shells up in the air fast enough either to explode near, or hit, their rapidly moving target. Anti-aircraft shells contain a powerful charge of powder, designed primarily to launch the projectile on its upward path with the greatest possible speed.

Bomber pilots have learned in this war to watch for the flash of anti-aircraft guns firing at them from below, according to Allied officers who have reported on their observations. When pilots see the flash of gunfire, they know that it will take several seconds for the shell to reach their level and explode. In this brief period of grace they try to dodge, if possible. Hence the importance of making shells travel upward at the greatest possible speed.

Airplanes have proved the best defense against enemy bombers, it has been found. During the heavy air attacks on England in 1940, British fighter planes shot down nearly ten times as many German bombers as did anti-aircraft guns.

Heavy guns of about 3-inch bore and upwards are used against high-flying

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Although its status as a vital British base carries the wartime penalty of enemy attack, Malta, in peace time, enjoys the economic advantages of heavy payrolls for workers and members of the armed forces. The islands, which must support a population of over a quarter of a million people, are far from self-sufficient, even in normal times. Intensive cultivation of the thin but fertile soil provides crops of grain, vegetables, and fruit, but the supply is inadequate to meet domestic needs. In one recent prewar year, Malta imported nearly $20,000,000 worth of goods, compared with exports which amounted to less than a million and a quarter dollars.

Note: For additional material on Malta see the following articles in the *National Geographic Magazine:* "Wanderers Awheel in Malta," August, 1940, and "The Maltese Islands," November, 1935.

See also the following GEOGRAPHIC SCHOOL BULLETINS: "Malta a Veteran of Italian and German Attacks," February 10, 1941, and "Malta, Pebble Off the Mediterranean Shores," November 23, 1936.

Malta may be located on the Map of Europe and the Near East, which was issued as a supplement to the *National Geographic Magazine* for May, 1940.

Bulletin No. 3, February 2, 1942.

Photograph by F. W. Stone from European

ONE-GOAT DAIRIES ARE FAMILIAR PART OF THE VALLETTA SCENE

Maltese goats are more in evidence in Malta's capital than the more widely known Maltese cats. As the thin-soiled, rocky islands furnish poor pasturage for cows, goats are the principal source of milk. Being less particular about their food than cows, they flourish there and roam the streets, casual, shaggy, and quite unconcerned over the fact that they sometimes transmit Malta fever ("undulant fever") to human beings. The Valletta housewife (above) smilingly buys the milk brought so conveniently to her door by the young milkman, but the British stationed there usually prefer to drink the canned variety for safety.

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Threatened Indies Oil Ranks Fifth in World Markets

THE fabled wealth of the Indies has been taking a liquid form in recent years, and appearing on world markets as gasoline, oil, and other petroleum products. As the Japanese invasion threatens Netherlands Indies oil wells with capture, Dutch defenders threaten them with destruction to prevent their falling into Japanese hands. Either way, there is the danger of loss to Oriental markets of the fifth-ranking source of the world's oil supplies.

In 1940, the wells of the rich Far East possession of exiled Queen Wilhelmina spouted more than 60 million barrels of oil.

Supplies Far East Customers, Especially British

The Netherlands Indies oil output is not large compared with production in the United States, which leads the world; U. S. output in 1940 was well over a billion and a quarter barrels, twenty times as much as the Indies yielded.

The Netherlands Indies production still is relatively small when measured against Russian output of nearly 213 million barrels; that of Venezuela, more than 184 million barrels; or of Iran, more than 78 million barrels.

On the other hand, while the Netherlands Indies supply amounts to less than 3 per cent of the world's petroleum, it is a significant source of oil for the Far East, where war makes fuel a more urgent need than before. The chief customer for Netherlands Indies oil, in normal times, is the British Empire. Singapore imports a quarter of the islands' output. Australia and New Zealand come next, and Egypt orders large quantities. China also looks to the Netherlands Indies for oil.

Japan has been an important customer at Indies oil wells. In 1938, the Nipponese were able to obtain only 4 per cent of the islands' exports. Then an agreement signed in November, 1940, between Japanese importers and Indies producers, provided for annual shipments to Japan of about 14 million barrels of oil, more than 20 per cent.

Industry Expanding from Curiosity Shop Beginnings

Since the opening of the first field sixty years ago, the history of the oil industry in the Netherlands Indies has been one of almost continuous expansion. Natives had for centuries obtained oil for their lamps from natural petroleum seeps; a burning jet of natural gas near Timor's Mota Mutika River they had reverenced as a sacred everlasting flame.

Shortly after the development of the first oil wells in the United States, a venturesome Dutchman began prospecting in the Netherlands Indies. By 1885 he had a producing well in northern Sumatra in the Pangkalan Brandan field, still one of the richest. The pioneer company was known as the "Royal Dutch Company for the Exploitation of Petroleum Wells in the Netherlands Indies," more commonly called "Royal Dutch."

Within twenty years, oil was gushing from Indies wells on the islands of Java and Borneo as well, in such quantities as to create a transportation shortage.

In its search for shipping facilities, Royal Dutch consolidated with the Shell Transport and Trading Company, a British firm which had originated in an old curiosity shop in Houndsditch, London, with a large stock of imported shells. The shell shop had grown so that it began to operate its own vessels, and had taken up

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bombers. Against dive-bombers, which zoom down close to their targets, light, rapid-fire anti-aircraft guns are effective, previous experience shows. One of the most useful is a 40-millimeter gun (about 1¼ inches in diameter). The best way to use such a gun is to wait until the dive-bomber is very close to the ground and the range is short, and then fire at high speed. If a dive-bomber is fired at when it is still high, the pilot can see the location of the guns, and has time to pull out of his dive and approach from a new direction.

Machine-gun fire also may be effective against dive-bombers if the gunner can hold his fire until the plane is at very close range, officers have observed. During the evacuation of the British army from Dunkerque, some German dive-bombers even were brought down by concentrated rifle fire.

One incidental use for heavy anti-aircraft guns is to show friendly fighter squadrons the location of enemy bombers. It is often difficult for flyers in the air to spot other planes. Gunners on the ground in England sometimes fire a few bursts of shrapnel in the direction of an enemy bomber formation, to point out its location to British planes that are in the air, then leave the battle to the airmen.

Anti-aircraft shells are set to explode at any desired height before they are loaded in the gun. The height, and other factors that enter into calculation of the range, are determined by secret and highly complicated apparatus. When a shell bursts, fragments are sent flying in all directions over a considerable area, and when falling to the ground may injure anyone who has not taken cover.

Bulletin No. 4, February 2, 1942.

Photograph by Harrison Forman

THE ANTI-AIRCRAFT GUN SWIVELS TO SIGHT ITS RAPIDLY MOVING TARGET

Gunners seated or standing on the metal rack projecting around the base of the gun operate controls which turn the weapon around or tilt it up and down, training it on enemy aircraft streaking across the sky. The gunners on the rack are carried as passengers when the gun turns. One man at the controls is visible in this picture (half-hidden behind soldier standing just left of gun). Although the barrel appears stubby because of foreshortening, the full size of the gun is indicated by the shell (right). This unit was photographed manning the defenses of Singapore. The turbaned soldier (left) is more easily recognizable, but all the gunners are Indian.

trading in Borneo oil on the side until eventually petroleum completely ousted shells from the stock.

The joining of these two organizations produced the famous Royal Dutch Shell, now one of the two largest organizations in the world. It has subsidiaries and affiliates in most oil-producing countries of the earth, including the United States. Standard Oil and Royal Dutch Shell are the dominant factors in the Indies oil fields.

1940 Production of Oil Triples That of 1924

By 1924, production in the islands had risen to more than 20 million barrels; by 1936, to more than 50 million barrels. The latest figure, 60,830,000 barrels, in 1940, shows an increase of more than three and a half million barrels over the output for 1938.

Six islands of the Netherlands Indies contribute to the total output. Sumatra and Borneo, where the Royal Dutch and the Shell interests respectively started their careers, are the foremost producers.

In the Netherlands part of Borneo, the tiny island of Tarakan just offshore and the Borneo field of Balikpapan are famous for their wells. On Sumatra, oil has brought into prominence the names of Palembang, Djambi, and Pangkalan Brandan. On the island of Java, producing fields cluster around the naval base of Soerabaja.

The sixth isle is Ceram in the Moluccas, where oil is again found near a naval base, the harbor of Amboina (Ambon). The latter, with its double attraction of oil and ships, has been a special target for Japanese attack.

Note: For further information on oil, and on the Netherlands Indies, see the following articles in the *National Geographic Magazine:* "Today's World Turns on Oil," June, 1941, and "Airplanes Come to the Isles of Spice," May, 1941.

The Netherlands Indies are shown on the Map of the Indian Ocean which was issued as a supplement to the *National Geographic Magazine,* March, 1941. Symbols indicate the location of oil wells.

Bulletin No. 5, February 2, 1942.

Photograph by Alice Schalek

THATCHED WELLS OF SUMATRA KEEP OIL AND WATER FROM MIXING

Oil wells at Pangkalan Soesoe, 45 miles from the city of Medan in northern Sumatra's volcanic highlands, are protected from tropical downpours by successive overlapping sections of thatched roof projecting around the derricks. On top of each derrick, a thatched framework encloses the pulley wheels and cables that operate drilling equipment, and a thatched hut to the side is the engine house. These wells, along with others at Djambi, Palembang, and Pangkalan Brandan, help to make Sumatra one of the most productive islands of the oil-rich Netherlands Indies.